

## 3.3 Prove Lines are Parallel

Postulate 16

Corresponding Angle ConverseIf corresponding  $\angle$ s are  $\cong$ , then the lines are  $\parallel$ .

Theorem 3.4

Alternate Interior Angle ConverseIf alternate interior  $\angle$ s are  $\cong$ , then the lines are  $\parallel$ .

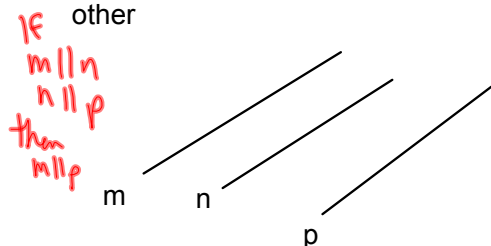
Theorem 3.5

Alternate Exterior Angle ConverseIf alternate exterior  $\angle$ s are  $\cong$ , then the lines are  $\parallel$ .

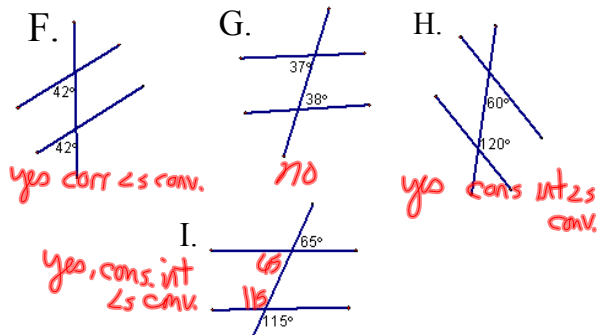
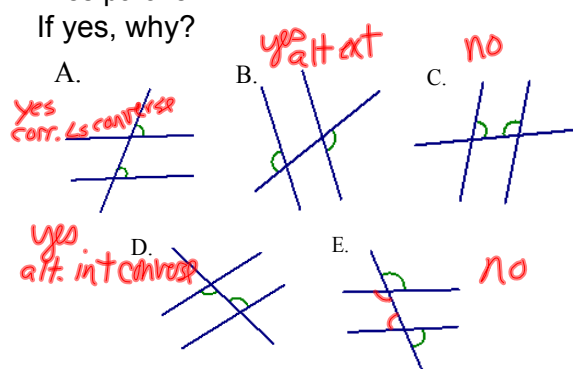
Theorem 3.6

Consecutive Interior Angle ConverseIf consecutive (same-side) interior  $\angle$ s are supplementary, then the lines are  $\parallel$ .

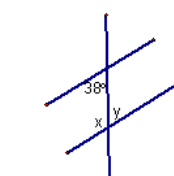
Theorem 3.7--Transitive Property of Parallel lines--If 2 lines are parallel to the same line, then they are parallel to each other



Is there enough information to prove the lines parallel?  
 If yes, why?

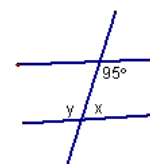


Find the value for x and y, so that the lines are parallel.



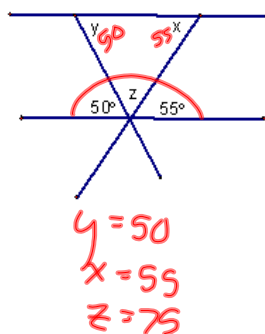
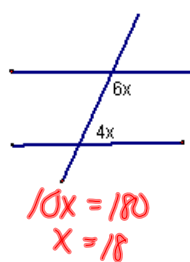
$$y = 38$$

$$x = 142$$



$$y = 95$$

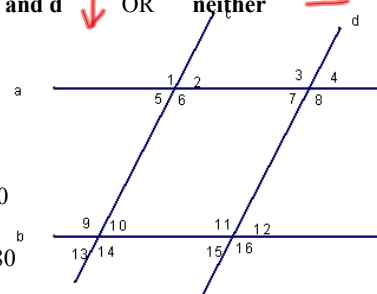
$$x = 85$$



Which lines are parallel based on the given information?

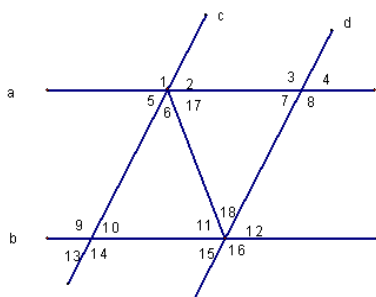
**a and b**  $\uparrow$  OR **c and d**  $\downarrow$  OR **neither**  $\text{---}$

- $\angle 1 \cong \angle 9$
- $\angle 13 \cong \angle 15$
- $\angle 7 \cong \angle 12$
- $\angle 3 \cong \angle 16$
- $\angle 1 \cong \angle 16$
- $m\angle 8 + m\angle 12 = 180$
- $m\angle 2 + m\angle 3 = 180$
- $m\angle 10 + m\angle 15 = 180$
- $\angle 13 \cong \angle 12$
- $\angle 1 \cong \angle 6$



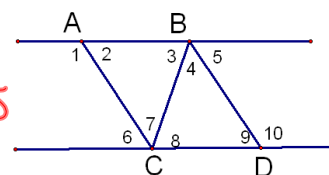
11.  $\angle 11 \cong \angle 17$

12.  $\angle 18 \cong \angle 6$

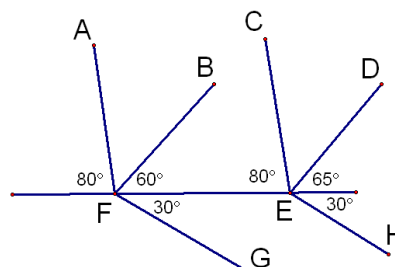
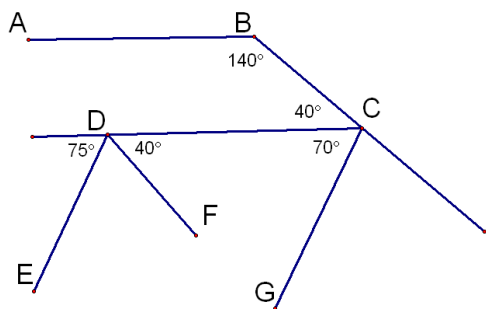


$\overline{AB} \parallel \overline{CD}$   $\uparrow$

Which lines, if any, are parallel?  $\overline{AC} \parallel \overline{BD}$   $\downarrow$



- $\angle 2 \cong \angle 6$
- $\angle 2 \cong \angle 5$
- $m\angle 2 + m\angle ABD = 180$
- $\angle 3 \cong \angle 8$
- $\angle 4 \cong \angle 7$
- $\angle 10 \cong \angle 6$



Ex 1

S	R
① $\angle 1 \cong \angle 2$	① Given
② $m \parallel n$	② Corr $\angle$ s Converse
③ $\angle 4 \cong \angle 3$	③ Corr $\angle$ s Postulate

Given:  $\angle 1 \cong \angle 2$   
Prove:  $\angle 4 \cong \angle 3$

Ex 2:

S	R
① $\angle 4 \cong \angle 7$	① Given
$l \parallel m$	② Cons. alt $\angle$ s thm
② $\angle 5 + \angle 7$ are suppl.	③ def of suppl.
③ $m\angle 5 + m\angle 7 = 180$	④ def of $\cong$
④ $m\angle 4 = m\angle 7$	⑤ Subst.
⑤ $m\angle 5 + m\angle 4 = 180$	⑥ def of suppl.
⑥ $\angle 5 + \angle 4$ are suppl.	⑦ Cons alt $\angle$ s Converse
⑦ $r \parallel s$	

Given:  $\angle 4 \cong \angle 7$   
Prove:  $r \parallel s$

HW

p165-168

10-15, 17, 19-21, 26-28, 34

